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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,063	06/24/2003	Joseph B. Allen	BUR920030034US1	1062

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EXAMINER

LIEW, ALEX KOK SOON

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 09/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/604,063

Applicant(s)

ALLEN ET AL.

Examiner

Alex Liew

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 – 5, 11 – 14, 16 – 20 and 26 – 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fridge (US pat no 4,648,053) in view of Chung (US pat no 5,481,472).

With regards to claim 1, Fridge discloses a method for reducing a number of shapes, said method comprising the steps of:

- forming a first shape pattern (see col. 5 lines 47 – 52 – the template shown in fig 3 has an inner and outer region error boundary),
- forming a second shape pattern, said second shape pattern including the first shape pattern and error shapes (see col. 6 lines 17 – 24 – the conductive layer 70 is red as the second shape pattern),
- extracting the error shapes from the second shape pattern (see col. 6 lines 20 – 32 – the excess area is read as the error shapes as shown in fig 4 – 74 and 76),
- deriving from a subset of the error shapes at least one environment shape corresponding to each error shape in the subset of the error shapes, said environment shape reflecting a local geometric environment of its corresponding

error shape (see col. 4 lines 17 – 23 – the defects is enlarged for inspection, see fig 5 – where each component 172, 174, 176, and 178 – the enlarged image is read as the environment shape).

But fails to disclose deleting a subset of the environment shapes such that only unique environment shapes satisfying a selection criterion remain. Chung discloses deleting a subset of the environment shapes such that only unique environment shapes satisfying a selection criterion remain (see col. 11 lines 15 – 19 – the list contains information about shapes, see col. 1 lines 8 – 13, 50 – 55, some are removed and some are appended, the criterion is shown in fig 8 with MIN value and see col. 13 lines 1 – 5 as an example). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include deleting a subset of the environment shapes because the number of data operated on during analysis for displacements is very much reduced and can be accomplished at very high speed (see col. 12 lines 11 – 17).

With regards with claim 2, Fridge discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by reference, but fails to disclose wherein the subset of the error shapes is a first group of the at least one group. Chung discloses a method of claim 1, said method further comprising distributing the error shapes into at least one group such that the at least one group is defined by a grouping criterion (see fig 19 –having assigned doses 25, 26 and 27, groupings of shapes, corresponding to different group of shapes, col. 13 lines 25 – 30, also see fig 10 – on the 'X-Coord' column it specify the position, x and y coordinate, the width and

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height, dose – col. 1 lines 50 – 55, and an identification code, see col. 6 lines 27 – 37), wherein the subset of the error shapes is a first group of the at least one group. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include subset of the error shapes because to organize each shape into each categories for classification purposes, so the system is able to identify which error shapes are most common in a semi-conductor chip pattern.

With regards to claim 3, see the rejection and rationale for claim 2.

With regards to claim 4, see the rejection for claim 2. In addition, the smallest grouping according to the doses from is grouping 25.

With regards to claim 5, see the rejection for claim 1. In addition, in Fridge each defect is expanded and shown in fig 5.

With regards to claim 11, Fridge discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by reference, but fails to disclose selection criterion relates to N independent characteristics. Chung discloses a method of claim 1, wherein the selection criterion relates to N independent characteristics of each environment shape such that N is at least 1 (see col. 1 lines 50 – 55 – there are four characteristic present, position of the shape x and y coordinate, and height and width, h and w), and wherein the deleting step includes sorting the

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environment shapes in accordance with N sort keys such that the N sort keys are the N independent characteristics (see code delta is sorted in order of the position). It would have been obvious to one having ordinary skill in the art at the time of the invention to include each shape having N characteristic present because to organize each shape into each categories for classification purposes, so the system is able to identify which error shapes are most common in a semi-conductor chip pattern.

With regards to claim 12, see the rejection for claim 11.

With regards with claim 13, Fridge discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by reference, but fails to disclose performing XOR on the first and second shape pattern. However, it is well known in the art for one skill in the art to use XOR function to extract error shapes (see MPEP 2144.03 official notice). It would have been obvious to one having ordinary skill in the art at the time of the invention to include XOR function because the output of an XOR function of two different values (when the defect detected on the image being inspected is outside the region of the original template when compared, values having 'OFF' XOR 'ON') is an 'ON' value indicting the position of the defect of the error shape, and distinguishing from regions that does not have errors (when two input values are the same 'OFF' XOR "OFF" or 'ON' XOR 'ON').

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With regards to claim 14, see the rejection and rationale for claim 1 (citation for last limitation – Chung col. 11 lines 15 – 19 – removal and appended).

With regards to claim 16, see the rejection and rationale for claim 1

With regards to claim 17, see the rejection and rationale for claim 2

With regards to claim 18, see the rejection and rationale for claim 3

With regards to claim 19, see the rejection and rationale for claim 4

With regards to claim 20, see the rejection and rationale for claim 5

With regards to claim 26, see the rejection and rationale for claim 11.

With regards to claim 27, see the rejection and rationale for claim 12.

With regards to claim 28, see the rejection and rationale for claim 13.

With regards to claim 29, see the rejection and rationale for claim 14.

3. Claims 6 – 10 and 21 – 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fridge (US pat no 4,648,053) in view of Chung (US pat no 5,481,472) as applied to claim 1 further in view of Simard (US pub no 2003/0202696).

With regards with claim 6, Fridge discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by reference, but fails to disclose outwardly projecting each bounding side of the error shape. Simard discloses a method of claim 5, wherein each error shape in the subset has a polygonal shape, and wherein expanding the first error shape comprises outwardly projecting each bounding side of the error shape by a distance in a direction perpendicular to the bounding side (see fig 3 to fig 4 – the objects in fig 3 is expanded into the objects in figure 4 – the distance of each side expanded is shown in fig 4 is two boxes perpendicular to the original shape for both shapes). It would have been obvious to one having ordinary skill in the art at the time of the invention to include expanding shape and forming at least one environment shape because to give a better view for user to identify the shapes for purpose of classification, as explained in the motivation for claim 2. Fridge and Simard are combinable because they are both in the field of detects detection.

With regards to claim 7 – 10, see the rejection and rationale for claim 6. In addition, the objects shown in figure four are in the same sub-set and both are

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expanded by the same amount of size, which is two boxes perpendicular on each side of the polygon.

With regards to claim 21, see the rejection and rationale for claim 6.

With regards to claim 22, see the rejection and rationale for claim 7.

With regards to claim 23, see the rejection and rationale for claim 8.

With regards to claim 24, see the rejection and rationale for claim 9

With regards to claim 25, see the rejection and rationale for claim 10.

With regards to claim 16, see the rejection and rationale for claim 1

4. Claims 15 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fridge ('053) in view of Chung ('472) as applied to claim 1 further in view of DeCamp (US pat no 6,063,132).

With regards to claim 15, Fridge discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by reference, but fails to disclose adding at least one anchor. DeCamp discloses a method of claim 1, wherein

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prior to the step of forming a first shape pattern the method further comprises providing a base geometry having at least one initial geometric shape (see fig 9 – 33 – as the initial geometric shape), and wherein the step of forming a first shape pattern comprises adding at least one anchor to the at least one initial geometric shape (see fig 9 – 33G – is one of the anchors added to the initial geometric shape) such that the first shape pattern so formed includes the at least one initial shape and the at least one anchor so added (descriptions found on col. 6 lines 57 – 62). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include adding at least one anchor because to recognize the shape of the error shape, so the user or operator is able to classify the error shape for future reference.

With regards to claim 30, see the rationale and rejection for claim 15.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623.

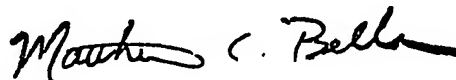
The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**Alex Liew**  
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**8/16/06**



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